KINE 4P84
Library Seminar
Fall 2024

Ian Gordon

Ian Gordon, Teaching & Learning Librarian

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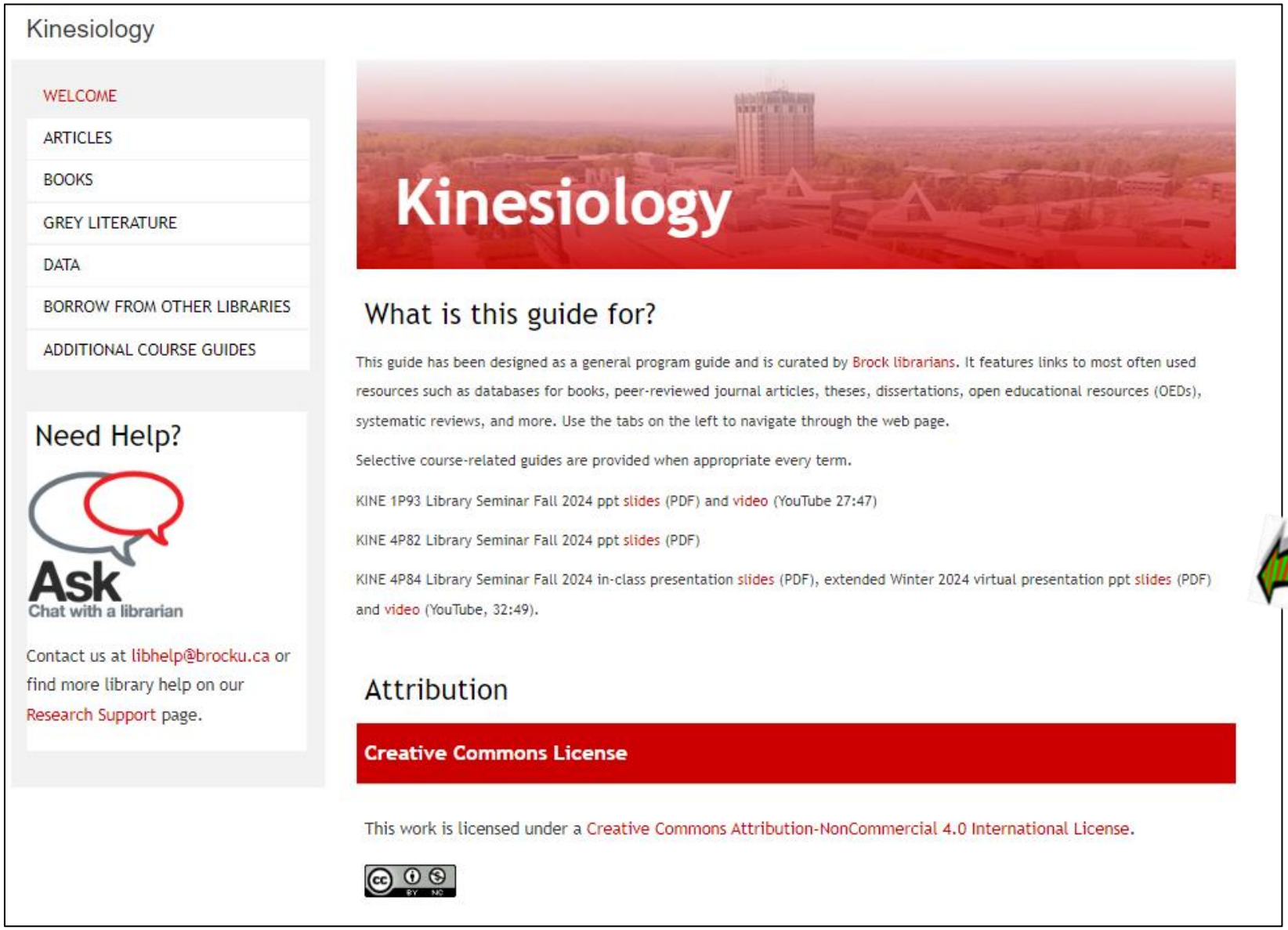

Library Seminar Agenda

- Research Question
- Brock Library KINE Research Guide
- Databases – lots of them
- MEDLINE – Which version?
- PubMed
- How to recognize empirical research papers!
- Citation Management
- Where, how and when to get help

Course Description:
The course will examine children's response to exercise, physical activity and physical training, focusing on the physiological response, trainability and performance. An emphasis will be put on the differences in response between children and adults and how growth and maturation may affect the response to exercise and training. The course will also examine exercise responses of healthy children in comparison to the responses of children with clinical impairments.

2. Assignments (40%)

See details at end of document. Any updates to details will be posted on Brightspace.

a. Completion of library resource modules, as posted on Brightspace **(5%)**
b. Group presentation **(two parts: 8%+17%=25%)** on a specific clinical condition or disease and its implications for exercise response, performance and training. Presentations will be assessed by the course instructor(s) and by students. Individuals' work within the group will be peer-assessed.
c. Individual written presentation assessment **(10%).** Students will be required to review and assess all presentations.

Huotari, P. R. T., Nupponen, H., Laakso, L., & Kujala, U. M. (2010). Secular trends in aerobic fitness performance in 13–18-year-old adolescents from 1976 to 2001. *British Journal of Sports Medicine, 44*(13), 968–972. https://doi.org/10.1136/bjsm.2008.055913

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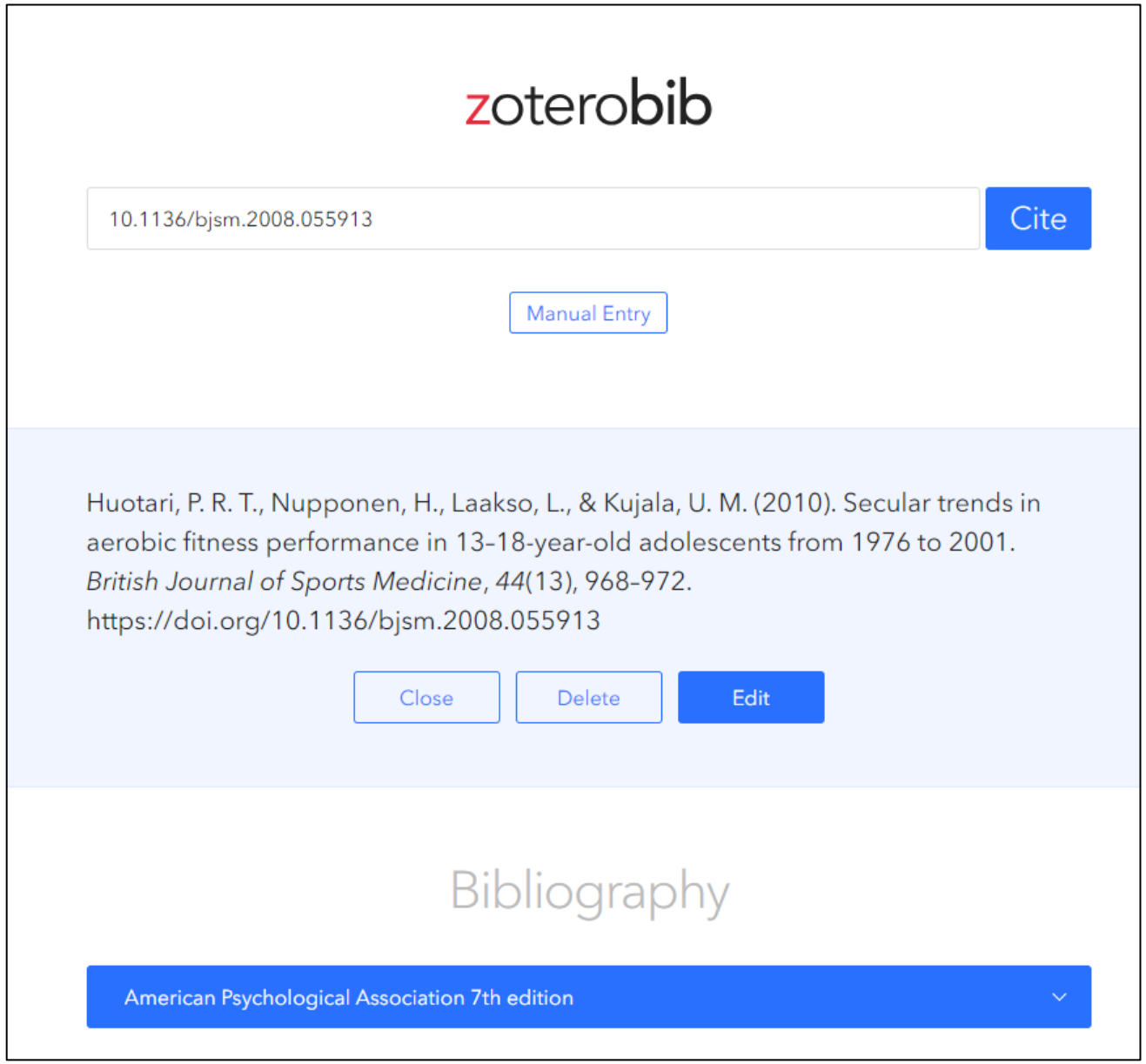

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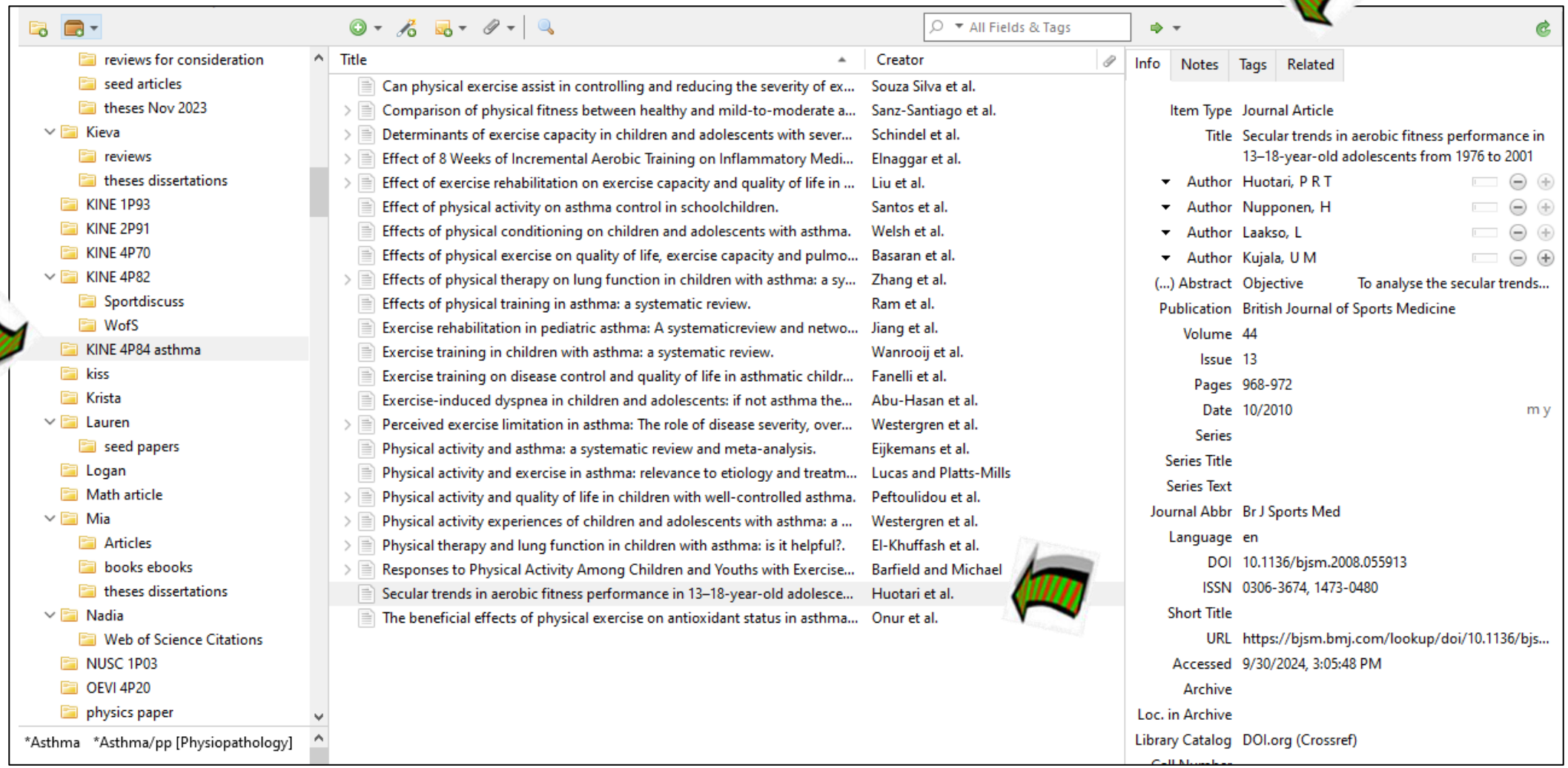

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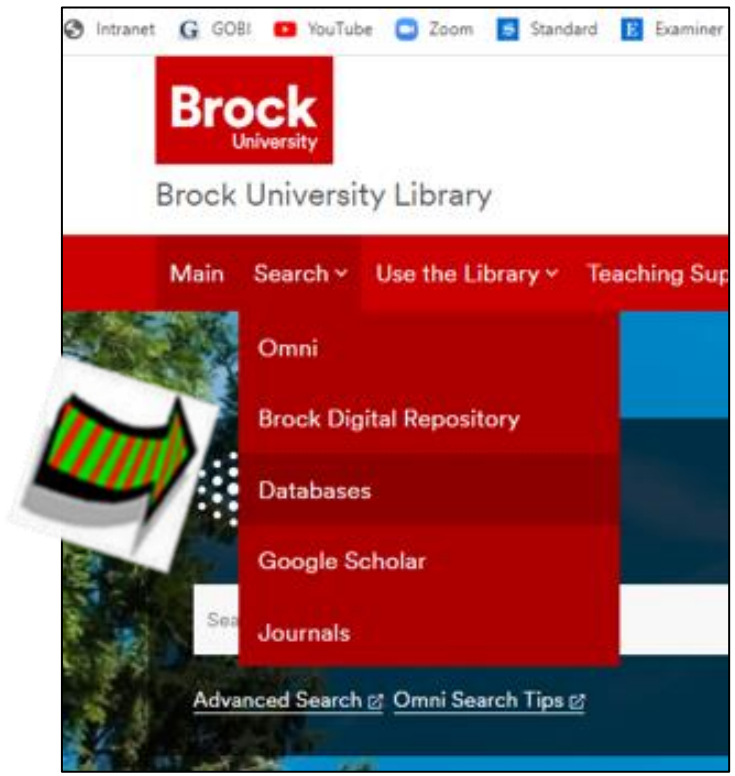

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Secular trends in aerobic fitness performance in 13–18-year-old adolescents from 1976 to 2001

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PRT Huotari, H Nupponen, L Laakso, UM Kujala
British journal of sports medicine, 2010 - bjsm.bmj.com

Objective

To analyse the secular trends in aerobic fitness performance and some of its determinants (body mass index (BMI) and leisure time physical activity (LTPA)) in adolescents.

Design

Cross-sectional population-based studies in 1976 and 2001 in Finland. A stratified random

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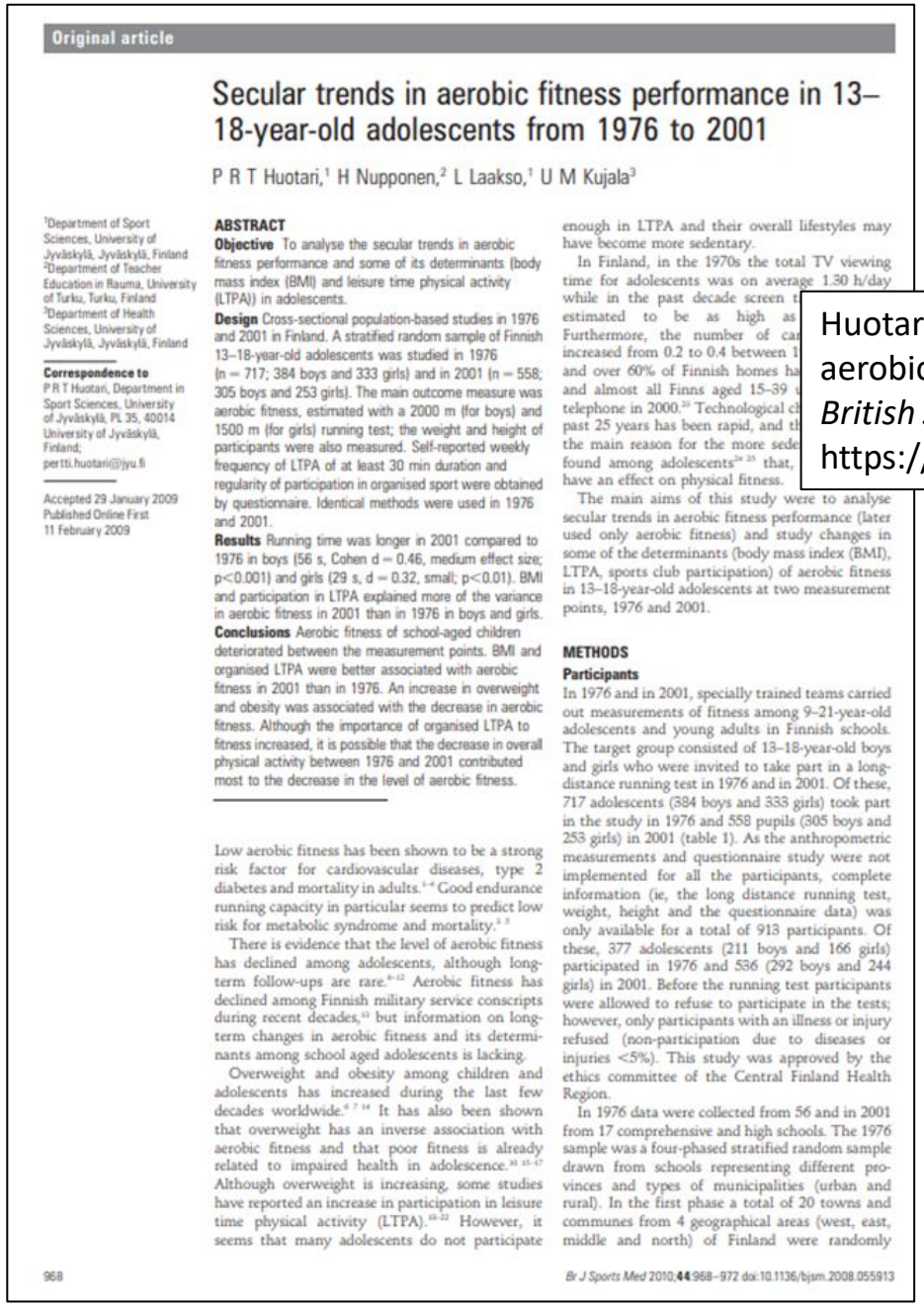

Original article

Secular trends in aerobic fitness performance in 13–18-year-old adolescents from 1976 to 2001

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ABSTRACT

Objective To analyse the secular trends in aerobic fitness performance and some of its determinants (body mass index (BMI) and leisure time physical activity (LTPA)) in adolescents.

Design Cross-sectional population-based studies in 1976 and 2001 in Finland. A stratified random sample of Finnish 13–18-year-old adolescents was studied in 1976 (n = 717; 384 boys and 333 girls) and in 2001 (n = 558; 305 boys and 253 girls). The main outcome measure was aerobic fitness, estimated with a 2000 m (for boys) and 1500 m (for girls) running test; the weight and height of participants were also measured. Self-reported weekly frequency of LTPA of at least 30 min duration and regularity of participation in organised sport were obtained by questionnaire. Identical methods were used in 1976 and 2001.

Results Running time was longer in 2001 compared to 1976 in boys (56 s, Cohen d = 0.46, medium effect size; p<0.001) and girls (29 s, d = 0.32, small; p<0.01). BMI and participation in LTPA explained more of the variance in aerobic fitness in 2001 than in 1976 in boys and girls.

Conclusions Aerobic fitness of school-aged children deteriorated between the measurement points. BMI and organised LTPA were better associated with aerobic fitness in 2001 than in 1976. An increase in overweight and obesity was associated with the decrease in aerobic fitness. Although the importance of organised LTPA to fitness increased, it is possible that the decrease in overall physical activity between 1976 and 2001 contributed most to the decrease in the level of aerobic fitness.

Low aerobic fitness has been shown to be a strong risk factor for cardiovascular diseases, type 2 diabetes and mortality in adults.[1–4] Good endurance running capacity in particular seems to predict low risk for metabolic syndrome and mortality.[3 5]

There is evidence that the level of aerobic fitness has declined among adolescents, although long-term follow-ups are rare.[6–12] Aerobic fitness has declined among Finnish military service conscripts during recent decades,[12] but information on long-term changes in aerobic fitness and its determinants among school aged adolescents is lacking.

Overweight and obesity among children and adolescents has increased during the last few decades worldwide.[6 7 14] It has also been shown that overweight has an inverse association with aerobic fitness and that poor fitness is already related to impaired health in adolescence.[10 15–17] Although overweight is increasing, some studies have reported an increase in participation in leisure time physical activity (LTPA).[18–22] However, it seems that many adolescents do not participate enough in LTPA and their overall lifestyles may have become more sedentary.

In Finland, in the 1970s the total TV viewing time for adolescents was on average 1.30 h/day while in the past decade screen t
estimated to be as high as
Furthermore, the number of ca
increased from 0.2 to 0.4 between 1
and over 60% of Finnish homes ha
and almost all Finns aged 15–39
telephone in 2000.[23] Technological ch
past 25 years has been rapid, and th
the main reason for the more sede
found among adolescents[24 25] that,
have an effect on physical fitness.

The main aims of this study were to analyse secular trends in aerobic fitness performance (later used only aerobic fitness) and study changes in some of the determinants (body mass index (BMI), LTPA, sports club participation) of aerobic fitness in 13–18-year-old adolescents at two measurement points, 1976 and 2001.

METHODS

Participants

In 1976 and in 2001, specially trained teams carried out measurements of fitness among 9–21-year-old adolescents and young adults in Finnish schools. The target group consisted of 13–18-year-old boys and girls who were invited to take part in a long-distance running test in 1976 and in 2001. Of these, 717 adolescents (384 boys and 333 girls) took part in the study in 1976 and 558 pupils (305 boys and 253 girls) in 2001 (table 1). As the anthropometric measurements and questionnaire study were not implemented for all the participants, complete information (ie, the long distance running test, weight, height and the questionnaire data) was only available for a total of 913 participants. Of these, 377 adolescents (211 boys and 166 girls) participated in 1976 and 536 (292 boys and 244 girls) in 2001. Before the running test participants were allowed to refuse to participate in the tests; however, only participants with an illness or injury refused (non-participation due to diseases or injuries <5%). This study was approved by the ethics committee of the Central Finland Health Region.

In 1976 data were collected from 56 and in 2001 from 17 comprehensive and high schools. The 1976 sample was a four-phased stratified random sample drawn from schools representing different provinces and types of municipalities (urban and rural). In the first phase a total of 20 towns and communes from 4 geographical areas (west, east, middle and north) of Finland were randomly

Br J Sports Med 2010;44:968–972 doi:10.1136/bjsm.2008.055913

Huotari, P. R. T., Nupponen, H., Laakso, L., & Kujala, U. M. (2010). Secular trends in aerobic fitness performance in 13–18-year-old adolescents from 1976 to 2001. *British Journal of Sports Medicine, 44*(13), 968–972. https://doi.org/10.1136/bjsm.2008.055913

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METHODS

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implemented for all the pa
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only available for a total of
these, 377 adolescents (211
participated in 1976 and 536
girls) in 2001. Before the runn

RESULTS

Secular trend in aerobic fitness from 1976 to 2001

The mean 2000 m running test time for boys in 1976 was 559 s (95% confidence interval (CI), 548 to 570 s) and in 2001 615 s (95% CI, 600 to 630 s). The mean 1500 m running test time for girls in 1976 was 494 s (95% CI, 486 to 503 s) and in 2001 523 s (95% CI, 510 to 535 s). The mean difference between 1976 and 2001 among boys was 56 s (increase 10%, p<0.001, Cohen d = 0.46, medium effect size) and among girls 29 s (increase 6%; p<0.01, d = 0.32, small effect size) (fig 1). The secular trend in distributions of running time is shown in figure 2.

Table 1 Characteristics of participants in 1976 and 2001

Characteristics	Boys, 1976 (n = 384)	Boys, 2001 (n = 305)	Girls, 1976 (n = 333)	Girls, 2001 (n = 253)
Age, years	15.9 (1.4)	15.4 (1.3)	15.7 (1.4)	15.3 (1.3)
Height, cm	170.0 (10.2)	170.8 (9.1)	163.2 (5.9)	162.0 (5.9)
Weight, kg	58.3 (11.7)	60.8 (12.3)	53.0 (7.5)	54.8 (9.8)
Body mass index	19.9 (2.5)	20.7 (3.2)	19.9 (2.4)	20.7 (3.3)
Leisure time physical activity, % (n):				
Less than twice a week	30.3 (116)	13.0 (39)	31.9 (106)	15.2 (38)
2–6 times a week	44.1 (169)	54.0 (162)	44.0 (146)	50.8 (127)
Every day	25.6 (98)	33.0 (99)	24.1 (80)	34.0 (85)
Sports club participation, % (n):				
No participation	68.0 (255)	52.2 (154)	82.8 (270)	69.8 (173)
Sometimes	12.3 (46)	4.7 (14)	6.7 (22)	4.0 (10)
Regular	19.7 (74)	43.1 (127)	10.4 (34)	26.2 (65)

Values are mean (SD) unless otherwise stated.

Table 2 Determinants of aerobic fitness index for boys and girls in 1976 and 2001

	Values for individual determinants*		Cumulative model†	
Determinant	β (95% CI)	R^2	R^2	p Value
Year 1976 boys (n = 211):				
Age	−0.11 (−0.17 to 0.02)	0.008	0.008	0.10
BMI	−0.13 (−0.12 to 0.01)	0.018	0.018	0.081
LTPA	0.26 (0.16 to 0.53)	0.064	0.070	<0.001
Sports club participation	0.20 (0.08 to 0.42)	0.042	0.082	0.059
Year 2001 boys (n = 292):				
Age	0.10 (−0.01 to 0.18)	0.007	0.007	0.078
BMI	−0.36 (−0.15 to −0.08)	0.127	0.127	<0.001
LTPA	0.23 (0.19 to 0.55)	0.058	0.179	<0.001
Sports club participation	0.30 (0.20 to 0.44)	0.096	0.230	<0.001
Year 1976 girls (n = 166):				
Age	0.08 (−0.05 to 0.16)	0.000	0.000	0.33
BMI	−0.10 (−0.10 to 0.03)	0.002	0.002	0.23
LTPA	0.26 (0.14 to 0.52)	0.062	0.077	<0.001
Sports club participation	0.16 (0.01 to 0.42)	0.020	0.082	0.18
Year 2001 girls (n = 244):				
Age	−0.06 (−0.15 to 0.06)	0.000	0.000	0.39
BMI	−0.42 (−0.18 to −0.10)	0.165	0.165	<0.001
LTPA	0.30 (0.29 to 0.67)	0.087	0.210	<0.001
Sports club participation	0.42 (0.37 to 0.65)	0.168	0.335	<0.001

*By linear regression analysis, values for other determinants than age are from models in which age has been entered first; †by linear regression analysis, R^2 and p values are from a fixed cumulative model.
BMI, body mass index; LTPA, leisure time physical activity.

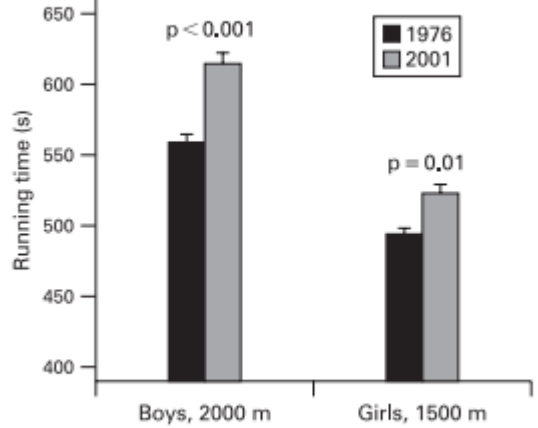

Figure 1 Running time in boys and girls in 1976 and in 2001. Age-adjusted p values for difference between 1976 and 2001 are shown.

DISCUSSION

The main findings of this study showed that, compared with the 1976 sample, boys and girls in 2001 had lower aerobic fitness and higher BMI. Secondly, BMI and LTPA, in particular participation in organised sports, explained the higher percentage of aerobic fitness in 2001 than in 1976.

In this study aerobic fitness was expressed as the absolute time taken in a long-distance running test (s) and the

Conclusions

In 13–18-year-old adolescents aerobic fitness declined during the 25 years from 1976 to 2001. Furthermore, we found a change in the explanatory power of the determinants of aerobic fitness: in 2001 BMI and LTPA explained a higher proportion of aerobic fitness than the same variables did in 1976. Adolescents who do not participate in LTPA and have high BMI are likely to show poorer aerobic fitness. Participation in organised sport, however, increased and it has continuing importance for Finnish adolescents' aerobic fitness.

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Journal of Exercise Science & Fitness 20 (2022) 182–189

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Effects of aerobic exercise combined with resistance training on health-related physical fitness in adolescents: A randomized controlled trial

Filipe Rodrigues Mendonça [a], Waynne Ferreira de Faria [b], Jadson Marcio da Silva [a], Ricardo Busquim Massuto [c], Géssika Castilho dos Santos [a, *], Renan Camargo Correa [a], Claudinei Ferreira dos Santos [b], Jeffer Eidi Sasaki [d], Antonio Stabelini Neto [a, b]

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Continuous aerobic training
Body composition
Cardiorespiratory fitness
Muscular fitness

ABSTRACT

Background/Objectives: This study aimed to compare the effects of two c
health-related physical fitness components in adolescents.
Methods: Seventy-six adolescents (16.1 ± 1.1 years, n = 44 female) wer
moderate-intensity continuous training combined with resistance trainin
interval training combined with resistance training (HIIT + RT), or Contr
performed twice weekly for 12 weeks. The health-related physical fitness
body composition, muscular and cardiorespiratory fitness.
Results: The intervention groups had a significant reduction in body fat pe
abdominal repetitions and VO_{2peak} after 12 weeks of combined exercise
vention effects were found to significantly reduce body fat percentage for the MICT + RT and HIIT + RT groups compared to the control group (mean difference: −3.8; 95% CI: −6.2; −1 0.3; mean difference: −4.7; 95%CI: −7.1; −2.3, respectively). For muscle fitness, significant effects of the intervention were found in increasing the number of abdominal repetitions favoring the MICT + RT group compared to the control group (mean difference: 9.5; 95% CI: 4.4; 14.7) and HIIT + RT compared to the control group (mean difference: 14.1; 95% CI 9; 19.3). For cardiorespiratory fitness, significant effects of the intervention on improving VO_{2peak} were found in the experimental groups (MICT + RT vs Control group: mean difference: 4.4; 95% CI: 2.2; 6.6; and HIIT + RT vs. Control group: mean difference: 5.5, 95% CI: 3.3; 7.7).
Conclusion: The results suggest that 12 weeks of training using MCIT + RT or HIIT + RT showed a similar effect for health-related physical fitness components in adolescents.

1. Introduction

Physical fitness can be defined as the capacity to perform daily activities with vigor and energy, and is primarily determined by genetics and training.[1] The physical fitness is an important health marker in childhood and adolescence,[2] as well as a predictor of cardiovascular (CVD) risk factors in adulthood.[3] Health-related physical fitness (HRPF) consists of five domains; however, body

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The association between physical fitness and health in a nationally representative sample of Canadian children and youth aged 6 to 17 years

Justin J. Lang, PhD (1,2); Richard Larouche, PhD (3); Mark S. Tremblay, PhD (2)

This article has been peer reviewed.

Abstract

Introduction: This study explored the relationship between physical fitness and indicators of physical and psychosocial health in a nationally representative sample of Canadian children and youth aged 6–17 years.

Methods: We conducted a secondary data analysis of Canadian Health Measures Survey (Cycles 1 and 2; 2007-2011) data. The physical fitness measures included cardiorespiratory fitness (CRF; modified Canadian Aerobic Fitness Test), strength (handgrip strength), flexibility (sit-and-reach), and muscular endurance (partial curl-ups). The physical health indicators included directly measured biomarkers (total and HDL [high-density lipoprotein] cholesterol, C-reactive protein, glucose, and HbA1c [glycohaemoglobin]) and measures of adiposity, resting heart rate, and blood pressure. Psychosocial health was assessed using the Strengths and Difficulties Questionnaire. Multiple linear regressions were used to determine the association between variables, stratified by age groups and sex.

Results: 3,800 (48.9% female) children and youth were retained for this analysis. CRF displayed significant favourable associations with most physical health indicators in male and female participants. There were less significant favourable associations with flexibility and muscular endurance compared with CRF across age and sex groups. Strength was associated with higher adiposity in males and females, and lower heart rate in male children ($\beta = -1.9$; 95% CI: −2.9, −1.0) and female youth ($\beta = -2.0$; 95% CI: −2.7, −1.2). There were few significant favourable associations between measures of physical fitness and psychosocial health in this sample of children and youth.

Conclusion: These findings suggest that physical fitness, and especially CRF, is a significant indicator of physical health among Canadian children and youth aged 6–17 years.

Keywords: *cardiorespiratory, psychosocial, strength, biomarkers, youth*

Highlights

- Physical fitness, especially cardiorespiratory fitness, is associated with favourable indicators of physical health among Canadian children aged 6 to 11 and youth aged 12 to 17 years.
- Associations between physical fitness and psychosocial health, as measured by the Strengths and Difficulties Questionnaire, are generally null and may require further research.
- Physical fitness assessments are feasible measures that could help improve the monitoring of paediatric health status.

Introduction

Physical fitness is a construct that includes cardiorespiratory fitness (CRF), muscular endurance and strength, flexibility, agility, and in some circumstances, body composition.[1] Physical fitness may reflect an individual's capability to perform daily physical activity or physical exercise, providing a potential indication of physical health status.[1–4] Studies indicate that some components of physical fitness, such as CRF, in late adolescence may predict future comorbidity, cardiovascular diseases, and all-cause mortality in adulthood.[5–7] Combined, these studies demonstrate the utility of physical fitness as an indicator to help better understand health among school-aged children and youth. However, in recent years, the national surveillance and regular monitoring of physical fitness among children and youth has not been prioritized in Canada.

In 2012, the Institute of Medicine (IOM) produced a comprehensive report on the role of physical fitness in describing youth health, with a focus on recommending health-related fitness measures that could be implemented in national youth fitness surveys conducted in the educational environment.[1] One area of future development identified by the IOM report was for national surveys to include measures of physical fitness along with other health measures to further confirm whether relationships between specific fitness test items and health outcomes exist (recommendation

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SPECIAL TOPICS: TOP 10 RESEARCH QUESTIONS

Top 10 Research Questions Related to Youth Aerobic Fitness

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ABSTRACT

Peak oxygen uptake ($\dot{V}O_2$) is internationally recognized as the criterion measure of youth aerobic fitness, but despite pediatric data being available for almost 80 years, its measurement and interpretation in relation to growth, maturation, and health remain controversial. The trainability of youth aerobic fitness continues to be hotly debated, and causal mechanisms of training-induced changes and their modulation by chronological age, biological maturation, and sex are still to be resolved. The daily physical activity of youth is characterized by intermittent bouts and rapid changes in intensity, but physical activity of the intensity and duration required to determine peak $\dot{V}O_2$ is rarely (if ever) experienced by most youth. In this context, it may therefore be the transient kinetics of pulmonary $\dot{V}O_2$ that best reflect youth aerobic fitness. There are remarkably few rigorous studies of youth pulmonary $\dot{V}O_2$ kinetics at the onset of exercise in different intensity domains, and the influence of chronological age, biological maturation, and sex during step changes in exercise intensity are not confidently documented. Understanding the trainability of the parameters of youth pulmonary $\dot{V}O_2$ kinetics is primarily based on a few comparative studies of athletes and nonathletes. The underlying mechanisms of changes due to training require further exploration. The aims of the present article are therefore to provide a brief overview of aerobic fitness during growth and maturation, increase awareness of current controversies in its assessment and interpretation, identify gaps in knowledge, raise 10 relevant research questions, and indicate potential areas for future research.

KEYWORDS

Adolescents; children; oxygen uptake kinetics; peak oxygen uptake

Aerobic fitness may be defined as the ability to deliver oxygen to the muscles and to utilize it to generate energy to support muscle activity during exercise. Maximal oxygen uptake ($\dot{V}O_2$ max), the highest rate at which oxygen can be consumed by the muscles during an exercise test to exhaustion, is widely recognized as the best single measure of aerobic fitness and has been the criterion measure of youth aerobic fitness for about 80 years. $\dot{V}O_2$ max (or later peak $\dot{V}O_2$) is the most comprehensively documented laboratory-determined variable in pediatric exercise physiology, but its assessment, interpretation, trainability, and relationship with other health-related variables during growth and maturation remain shrouded in controversy.

$\dot{V}O_2$ max limits the capacity to perform aerobic exercise, but it does not define all aspects of aerobic fitness. In everyday life, young people's spontaneous play and participation in sport are more concerned with short duration, intermittent exercise, and rapid changes in exercise intensity. Under these conditions, $\dot{V}O_2$ max might be considered a variable of investigative convenience rather than the principal physiological variable underpinning exercise behavior, and it is the kinetics of pulmonary $\dot{V}O_2$ ($p\dot{V}O_2$) that best describe aerobic fitness. In contrast with studies of $\dot{V}O_2$ max, there are remarkably few investigations of young people's $p\dot{V}O_2$ kinetic responses to step changes in exercise intensity. Studies of the trainability of youth $p\dot{V}O_2$ kinetic responses are even rarer, and current comprehension is primarily based on comparative analyses of youth athletes and nonathletes.

The present discussion recognizes that there are several other indicators of aerobic fitness, including blood lactate and ventilatory thresholds, exercise economy, and recovery $p\dot{V}O_2$ kinetics, but the focus herein is on $\dot{V}O_2$ max (or peak $\dot{V}O_2$) and $p\dot{V}O_2$ kinetics at the onset of exercise, arguably the two most pertinent markers of youth aerobic fitness. The objectives of this article are to outline current understanding, reveal controversies in assessment and interpretation, identify gaps in knowledge, raise 10 relevant research questions (see Table 1), and indicate avenues for future research in youth aerobic fitness. The focus is primarily on the aerobic fitness of normal, healthy

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Implications for children with asthma for exercise, performance, and training?

perplexity

Answer

Exercise and physical activity have important implications for children with asthma in terms of their performance, health outcomes, and overall quality of life. Here are the key implications based on the research:

Benefits of Exercise for Asthmatic Children

Improved Lung Function and Fitness

- Exercise interventions can lead to significant improvements in lung function measures like FEV1 and FVC in asthmatic children [1][2].
- Aerobic fitness and exercise capacity often increase after sustained exercise programs [1][2].

Better Asthma Control

- Regular physical activity is associated with better asthma symptom control and reduced use of asthma medications [1].
- Exercise training may decrease bronchial hyperresponsiveness in children with mild asthma [4].

Enhanced Quality of Life

- Participation in exercise programs is linked to improved asthma-related quality of life scores [1][2].
- Children report feeling their asthma and overall fitness have improved after exercise interventions [3].

Training Recommendations

Program Design

- Exercise interventions should last at least 3 months, with 2+ sessions per week [1].
- Target intensity should be around 80% of maximum heart rate [1][3].

Exercise Modes

- Both structured exercise programs and active play can be beneficial [1][3].
- Swimming, team sports, and aerobic exercise have all shown positive effects [1].

Safety Considerations

- Ensure adequate asthma control before initiating an exercise program [1].
- Use pre-exercise bronchodilators if needed to prevent EIB [4].
- Start with lower intensities and gradually increase as tolerated.

In conclusion, regular exercise and physical activity should be encouraged for children with asthma as part of their overall management plan. With proper precautions and asthma control, exercise can significantly improve lung function, fitness, symptoms, and quality of life in asthmatic children. Healthcare providers should work with families to develop appropriate, enjoyable, and safe exercise programs tailored to each child's needs and interests.

Implications for children with asthma for exercise, performance, and training?

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1. Exercise and Lifestyle Changes in Pediatric Asthma - PMC - NCBI

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Several small studies in children with asthma suggest that exercise interventions can improve aerobic fitness, asthma symptoms or control, and quality of life.

2. Feasibility of exercise therapy for children with asthma - Frontiers

frontiersin

Background: Although numerous studies have demonstrated the clear benefits of exercise for people with asthma, controversy remains. This study evaluated the effects of sustained exercise types on lung function and quality of life in patients with asthma. Methods: We searched PubMed, EMBASE, Web of Science, Cochrane Library, China National Knowledge Infrastructure (CNKI), and Wanfang database since January 2000 to August 2022 .included randomized controlled trials (RCTs) of asthmatic children...

3. Active play exercise intervention in children with asthma - NCBI

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Increased physical activity (PA) may be beneficial for children with asthma. Knowledge about how to intervene and encourage children with asthma to be physically active is required. In the present study, we aimed to pilot a 6-week exercise intervention designed as active play and examine attendance rate, exercise intensity and children's perceptions of participating. 6 children with asthma (4 boys, 2 girls) aged 10–12 years, participated in 60 min of active play exercise twice weekly. A...

4. Asthma, exercise and metabolic dysregulation in paediatrics - Elsevier

elsevier

Asthma is the most frequent chronic disease in childhood. Chest tightness, cough, wheezing and dyspnoea during or after exercise may be unique manifestations of asthma in up to 90% of subjects. Physical activity may be reduced by uncontrolled asthma symptoms and parental beliefs, impairing physical fitness of asthmatic children. Clinicians working in the field of allergy are aware of evidence supporting the benefits of physical activity for patients with asthma. Treatment of asthma is required...

5. Exploring and explaining low participation in physical activity among ...

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A multi-faceted approach is needed to translate the rhetoric of increasing activity levels in young people to the reality of improved fitness. Physical activity leading to improved fitness should become part of a goal orientated management strategy by schools, families, health care professionals and individuals. Exercise induced asthma should be regarded as a marker of poor control and a need to increase fitness rather as an excuse for inactivity. Individuals' perceptual accuracy deserves...

6. Asthma and Exercise | American Lung Association

lung

Exercise is important for overall health as well as lung health, and there are many benefits of physical activity for people living with asthma. Daily exercise helps to improve your lungs capacity, in other words, the maximum amount of oxygen your body can use. Also, exercise increases blood flow to your lungs, promoting blood flow to the heart which pumps oxygen throughout your body. For example, people who exercise have more ability to pull oxygen from the lungs and into the blood that feeds...

7. Exercise-induced asthma - Symptoms & causes - Mayo Clinic

mayoclinic

Exercise-induced asthma is when the airways narrow or squeeze during hard physical activity. It causes shortness of breath, wheezing, coughing, and other symptoms during or after exercise. The medical term for this condition is exercise-induced bronchoconstriction (brong-koh-kun-STRIK-shun). Many people with asthma have exercise-induced bronchoconstriction. But people without asthma also can have it. Most people with exercise-induced bronchoconstriction can continue to exercise and...

8. Effect of high-intensity interval training in adolescents with asthma

sciencedirect

Effect of high-intensity interval training in adolescents with asthma: The eXercise for Asthma with Commando Joe's® (X4ACJ) trial Winn Charles O.N. Mackintosh Kelly A. Eddolls William T.B. Stratton Gareth Wilson Andrew M. McNarry Melitta A. Davies Gwyneth A. Original Article 05/30/2019 [EFFECTS OF PHYSICAL EXERCISE ON QUALITY OF LIFE, EXERCISE CAPACITY AND PULMONARY FUNCTION IN CHILDREN WITH ASTHMA](https://doi.org/10.1080/16501970500476142) [Exercise Training on...

Research Topic:

I want to find scholarly research articles on the most effective exercise training schedules for improving asthma management in children, focusing on the types of exercises that enhance lung function, physical activity capacity, and overall quality of life.

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Detailed summary

Regular exercise, particularly aerobic and intermittent training, significantly improves lung function, physical activity capacity, and quality of life in children with asthma, as demonstrated by several studies including [1 , 2 , 3].

- **Exercise Types and Benefits**
  - Aerobic exercises such as swimming and cycling were most commonly examined and found to improve cardiorespiratory fitness and decrease asthma symptoms [5 , 9].
  - Intermittent training, which alternates intensity levels, yielded favorable outcomes in lung function, quality of life, and physical capacity [3].
  - Breathing exercises and aerobic activities like Tai-Chi also showed positive impacts [5].
- **Training Programs and Schedules**
  - Programs varied from 8 to 24 weeks, with training 2 to 6 times per week for 30-70 minutes per session, generally leading to improved lung function and quality of life [2 , 9 , 10].
  - Moderate to vigorous intensity training seems optimal, with improvements typically seen in FEV1, FEV6, exercise tolerance, and quality of life metrics [3 , 8].
- **Quality of Life and Lung Function**
  - Significant enhancements in the Pediatric Asthma Quality of Life Questionnaire (PAQLQ) scores and reductions in dyspnea and exercise-induced bronchoconstriction were noted, underscoring the psychosocial benefits of regular exercise [1 , 4].
  - Although not all studies reported significant changes in spirometric measures, most indicated a trend towards better lung function and reduced need for medications [1 , 7].
- **Dose-Response and Recommendations**
  - A systematic review highlighted a dose-response relationship, suggesting regular, moderate to vigorous intensity exercise is most effective [5].
  - Continuous monitoring and adaptation of exercise programs are recommended to accommodate individual responses and maximize benefits while minimizing risks [5 , 9].

Research Topic:

I want to find scholarly research articles on the most effective exercise training schedules for improving asthma management in children, focusing on the types of exercises that enhance lung function, physical activity capacity, and overall quality of life.

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Asthma, a chronic inflammatory disease of the airways, significantly affects millions of children worldwide by causing symptoms such as wheezing, breathlessness, and cough [1]. Effective asthma management traditionally involves medication and lifestyle interventions, including regular physical activity, which is recommended to improve overall health while managing symptoms [1]. Recent research has focused on determining specific exercise training schedules that can effectively enhance lung function, physical activity capacity, and quality of life in children with asthma.

Studies have investigated various exercise modalities, primarily highlighting aerobic exercises like swimming, cycling, and structured programs such as intermittent training with alternating high- and low-intensity periods [1 , 3 , 5 , 9]. For instance, swimming offers a warm and humid environment conducive to respiratory ease, while intermittent training has demonstrated improvements in lung function, physical activity, and quality of life [5 , 9].

Investigations into the impact of exercise on lung function metrics are prevalent, showing enhancements in forced expiratory volume (FEV1) and vital capacity (FVC) [3 , 8 , 10]. Interventions varying from 8 to 24 weeks, often conducted 2-6 times a week for 30-70 minutes per session, indicated improvements in metrics like exercise tolerance and reductions in asthma symptoms, demonstrating a trend toward better pulmonary outcomes [2 , 9 , 10].

The Pediatric Asthma Quality of Life Questionnaire (PAQLQ) has been a consistent measure across studies to quantify improvements in quality of life, activity levels, and emotional well-being following exercise interventions [1 , 4 , 6 , 7]. Notably, training sessions of moderate to vigorous intensity were associated with significant increases in these quality of life scores [2 , 6].

Reviews and meta-analyses have synthesized these findings, illustrating a general consensus on the benefits of structured exercise programs for asthmatic children, albeit with variations in the specifics of training protocols and outcomes measured [5 , 7 , 8]. Systematic approaches underline a dose-response relationship, suggesting that tailored exercise regimens are essential for maximizing clinical benefits while minimizing associated risks [5 , 9].

Collectively, literature suggests that appropriately designed exercise training regimes can enhance asthma management in children by improving key physiological and quality of life parameters. Continued research is necessary to refine these exercise prescriptions further and integrate them effectively into broader asthma management strategies.

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99.9%	13.4	2007	**[1] Exercise training on disease control and quality of life in asthmatic children.** Adriana Fanelli, ..., and C. Carvalho Medicine and science in sports and exercise 2007 - 229 citations - Show abstract - Cite
98.8%	9.3	2006	**[2] Effects of physical exercise on quality of life, exercise capacity and pulmonary function in children with asthma.** Sibel Başaran, ..., and D. Ufuk Altıntaş Journal of rehabilitation medicine 2006 - 173 citations - Show abstract - Cite
97.9%	2.9	2014	**[3] The effectiveness of an indoor intermittent training program for improving lung function, physical capacity, body composition and quality of life in children with asthma** P. Latorre-Román, ..., and F. García-Pinillos Journal of Asthma 2014 - 31 citations - Show abstract - Cite
96.6%	0.5	2009	**[4] Effects of Physical Exercise on Quality of Life, Pulmonary Function and Symptom Score in Children with Asthma** H. Yuksel, ..., and E. Onur Journal Not Provided 2009 - 7 citations - Show abstract - Cite
96.4%	0.0	2018	**[5] Dose-response Effects Of Exercises In Children With Asthma: A Review** Peibei Li, ..., and Weimo Zhu Journal is not defined within the JOURNAL database. 2018 - 0 citations - Show abstract - Cite
94.7%	4.3	2018	**[6] Evaluating pulmonary function, aerobic capacity, and pediatric quality of life following a 10-week aerobic exercise training in school-aged asthmatics: a randomized controlled trial** Walid Kamal, ..., and D. Kamel Patient preference and adherence 2018 - 27 citations - Show abstract - Cite - PDF
93.7%	3.2	2012	**[7] The effect of physical training in children with asthma on pulmonary function, aerobic capacity and health-related qua of life: a systematic review of randomized control trials.** Allison Crosbie Pediatric exercise science 2012 - 39 citations - Show abstract - Cite
92.1%	0.0	2023	**[8] Feasibility of exercise therapy for children with asthma: a meta-analysis** Lin Zhou and Haofu Xu Frontiers in Cell and Developmental Biology 2023 - 0 citations - Show abstract - Cite - PDF
91.3%	0.0	2022	**[9] Impacts of aerobic exercise on children with asthma diagnosis: integrative review** Bianca Espinosa dos Santos, ..., and Leila Simone Foerster Merey REVISTA CIÊNCIAS EM SAÚDE 2022 - 0 citations - Show abstract - Cite - PDF
91.2%	2.2	2021	**[10] Effects of Physical Exercises on Pulmonary Rehabilitation, Exercise Capacity, and Quality of Life in Children with Asthma: A Meta-Analysis** YiRan Liu, ..., and Lin Liu Evidence-based Complementary and Alternative Medicine : eCAM 2021 - 6 citations - Show abstract - Cite - PDF

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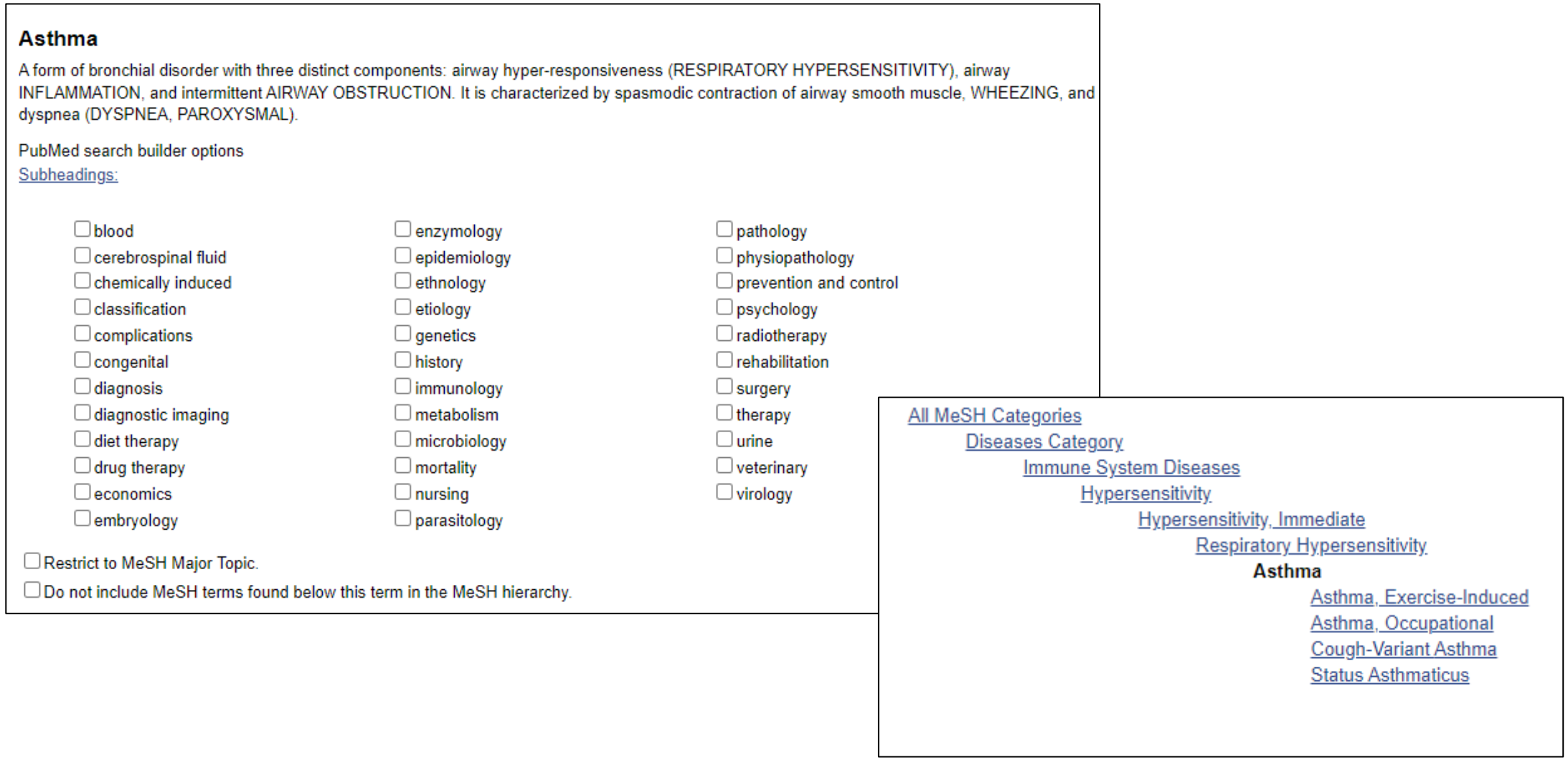

Asthma

A form of bronchial disorder with three distinct components: airway hyper-responsiveness (RESPIRATORY HYPERSENSITIVITY), airway INFLAMMATION, and intermittent AIRWAY OBSTRUCTION. It is characterized by spasmodic contraction of airway smooth muscle, WHEEZING, and dyspnea (DYSPNEA, PAROXYSMAL).

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Status Asthmaticus

Exercise

Physical activity which is usually regular and done with the intention of improving or maintaining PHYSICAL FITNESS or HEALTH. Contrast with PHYSICAL EXERTION which is concerned largely with the physiologic and metabolic response to energy expenditure.
Year introduced: 1989

PubMed search builder options
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              - Endurance Training
              - High-Intensity Interval Training
              - Plyometric Exercise
              - Resistance Training
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            - Preoperative Exercise
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              - Jogging
              - Marathon Running
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            - Warm-Up Exercise

Child

A person 6 to 12 years of age. An individual 2 to 5 years old is CHILD, PRESCHOOL.

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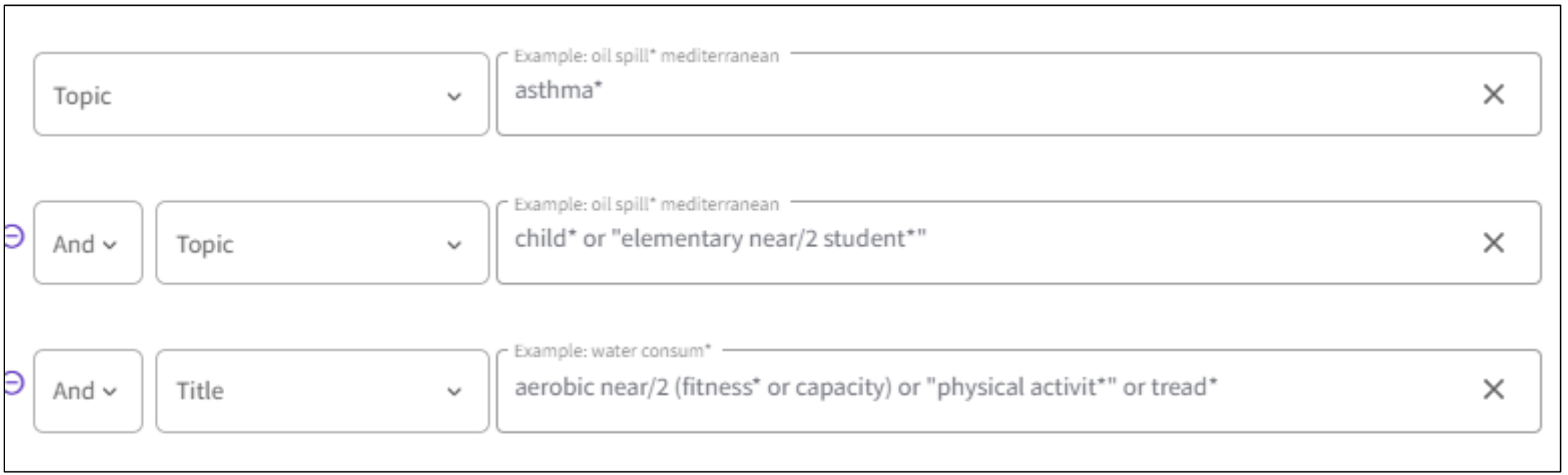

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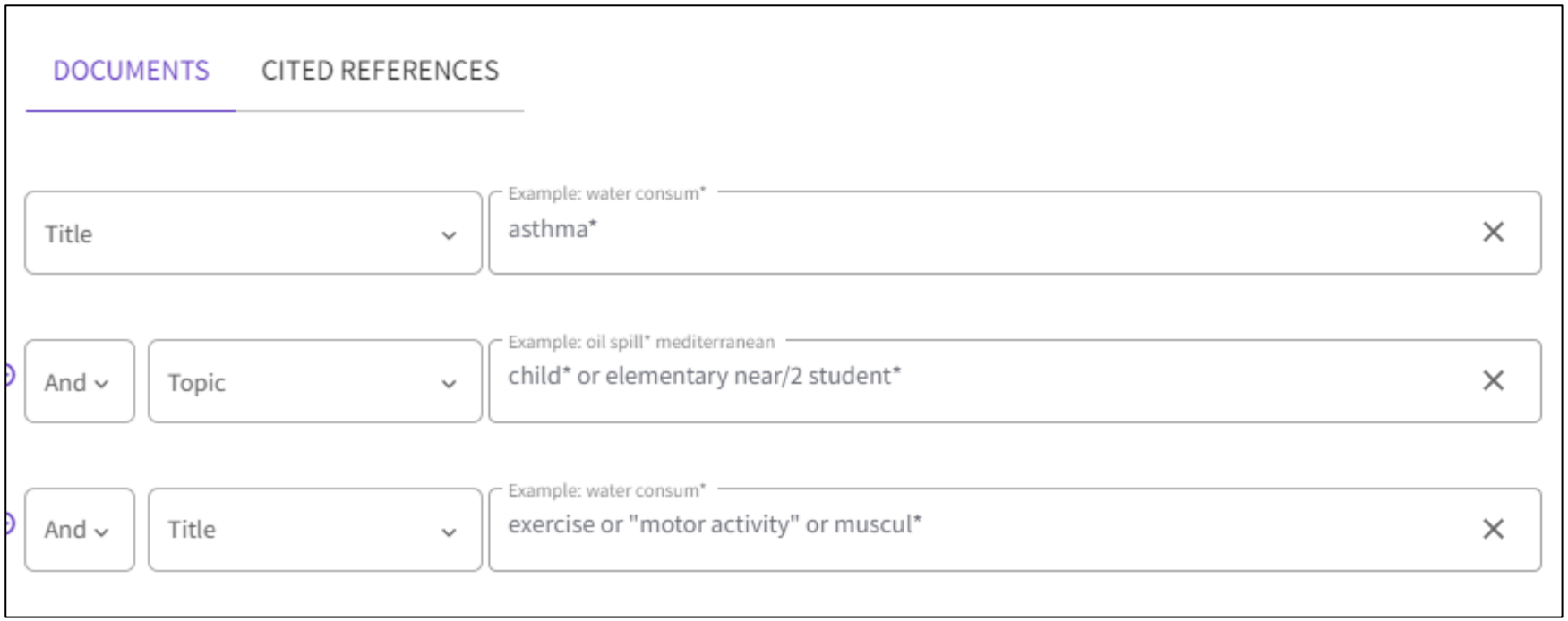
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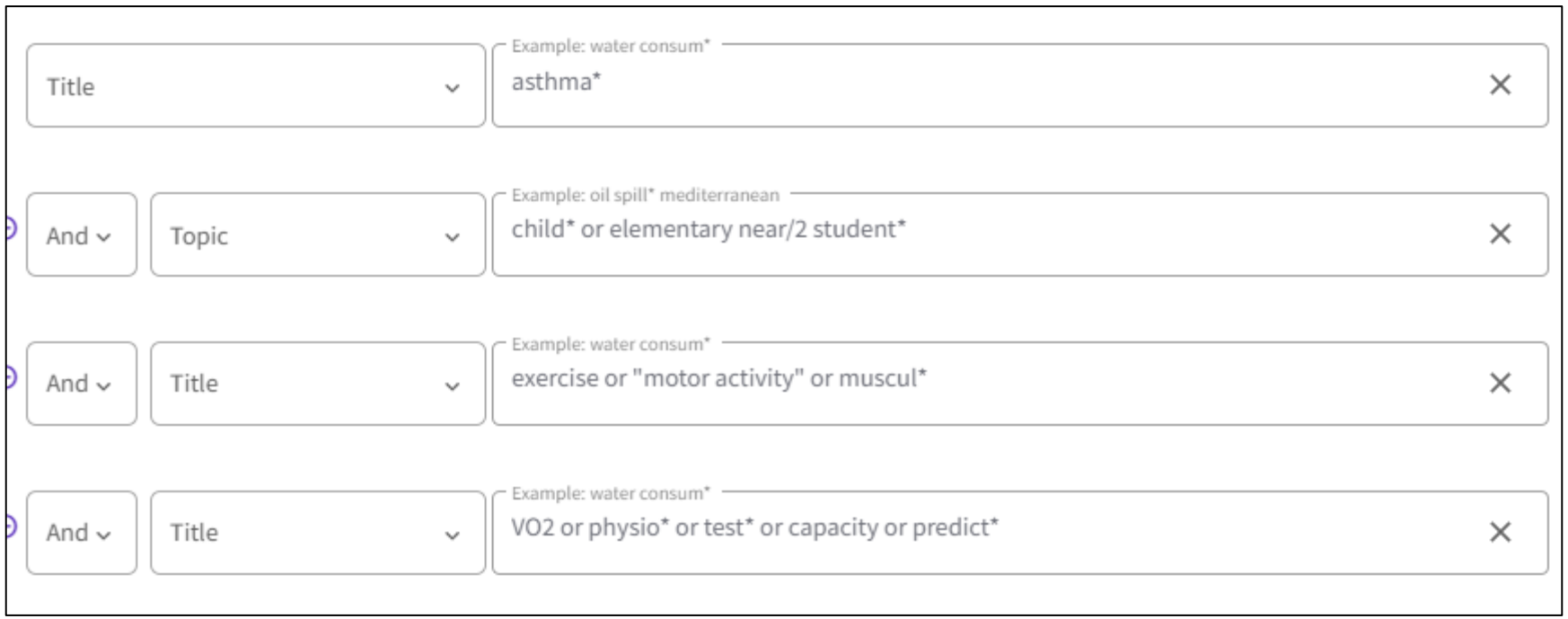
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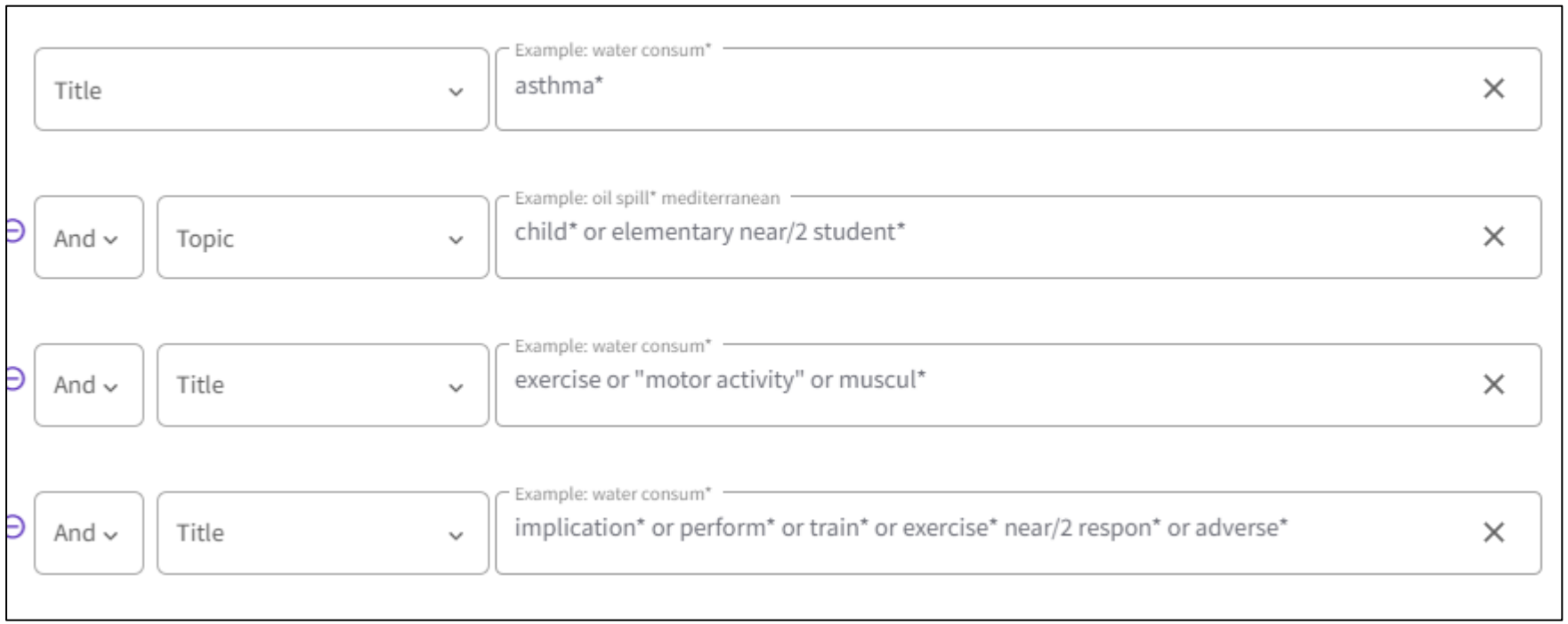
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Effect of physical activity on asthma control in schoolchildren

Efeito da atividade física no controle da asma em escolares

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ABSTRACT

Objective: To investigate the effect of levels of physical activity on asthma control in children. **Methods:** A cross-sectional study, including public school students aged 8 to 12 years, of both sexes, with asthma, from a capital and a medium-sized cities in Southern Brazil. At home, the students answered the questionnaire on levels of physical activity and disease control. **Results:** A total of 482 schoolchildren with asthma participated in the study, with mean age of 10.9±2.2 years, and 253 (52%) were girls. Regarding disease control, 50% had controlled asthma, and 67% were considered sedentary. Schoolchildren with controlled asthma were more active than those with uncontrolled asthma (p=0.032). Active schoolchildren were more likely to have asthma controlled (OR=1.5; 95%CI: 1.04-2.25). **Conclusion:** The results demonstrated an association between physical activity levels and asthma control. More active schoolchildren were more likely to have asthma controlled.

Keywords: Asthma; Exercise; Sedentary behavior; Child; Adolescent

RESUMO

Objetivo: Investigar o efeito dos níveis de atividade física no controle da asma em crianças. **Métodos:** Estudo transversal, incluindo escolares da rede pública, de 8 a 12 anos, de ambos os sexos, com asma, de uma capital e de uma cidade de porte médio da Região Sul do Brasil. Os escolares responderam, em seus domicílios, um questionário de níveis de atividade física e de controle da doença. **Resultados:** Participaram da pesquisa 482 escolares com asma, com média de idade de 10,9±2,2 anos, e 253 (52%) eram meninas. Quanto ao controle da doença, 50% apresentavam asma controlada e 67% foram considerados sedentários. Os escolares com asma controlada foram mais ativos do que os com asma não controlada (p=0,032). Os escolares ativos tiveram mais chance de ter a asma controlada (RC=1,5; IC95%: 1,04-2,25). **Conclusão:** Os resultados demonstraram associação entre os níveis de atividade física e controle da asma. Os escolares mais ativos apresentaram mais chance de ter a asma controlada.

Descritores: Asma; Exercício; Comportamento sedentário; Criança; Adolescente

INTRODUCTION

Asthma is considered the most prevalent chronic disease in the pediatric age groups, affecting from 8.7 to 30.8% of this population in different Latin American countries.[1] Due to its multifactorial etiology, compliance with treatment and control of the disease can be influenced by various factors.[1,2] Absence of adequate control results in exacerbations and hospitalizations. In Brazil, there are approximately 110 hospitalizations for every 100 thousand

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Conflict of interest:
none.

MeSH terms

- Adolescent
- Asthma / prevention & control*
- Brazil
- Child
- Cross-Sectional Studies
- Exercise / physiology*
- Female
- Humans
- Male
- Sedentary Behavior
- Socioeconomic Factors
- Students / statistics & numerical data*
- Surveys and Questionnaires

Exercise

Physical activity which is usually regular and done with the intention of improving or maintaining PHYSICAL FITNESS or HEALTH. Contrast with PHYSICAL EXERTION which is concerned largely with the physiologic and metabolic response to energy expenditure.
Year introduced: 1989

PubMed search builder options
Subheadings:

- adverse effects
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- genetics
- history
- immunology
- physiology
- psychology
- standard
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- trends

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All MeSH Categories
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  - Musculoskeletal and Neural Physiological Phenomena
    - Musculoskeletal Physiological Phenomena
      - Movement
        - Motor Activity
          - **Exercise**
            - Cool-Down Exercise
            - Exergaming
            - Gymnastics
            - Muscle Stretching Exercises
            - Physical Conditioning, Animal
            - Physical Conditioning, Human
              - Circuit-Based Exercise
              - Endurance Training
              - High-Intensity Interval Training
              - Plyometric Exercise
              - Resistance Training
            - Post-Exercise Recovery
            - Preoperative Exercise
            - Running
              - Jogging
              - Marathon Running
            - Swimming
            - Walking
              - Nordic Walking
              - Stair Climbing
            - Warm-Up Exercise

Swimming

An activity in which the body is propelled through water by specific movement of the arms and/or the legs. Swimming as propulsion through water by the movement of limbs, tail, or fins of animals is often studied as a form of PHYSICAL EXERTION or endurance.

PubMed search builder options

Subheadings:

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- ☐ education
- ☐ ethics
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Tree Number(s): G11.427.410.568.800, G11.427.410.698.277.875, I03.350.875, I03.450.642.845.945.500

MeSH Unique ID: D013550

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    - Musculoskeletal Physiological Phenomena
      - Movement
        - Locomotion
          - **Swimming**

All MeSH Categories
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    - Musculoskeletal Physiological Phenomena
      - Movement
        - Motor Activity
          - Exercise
            - **Swimming**

All MeSH Categories
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  - Human Activities
    - Exercise
      - **Swimming**

All MeSH Categories
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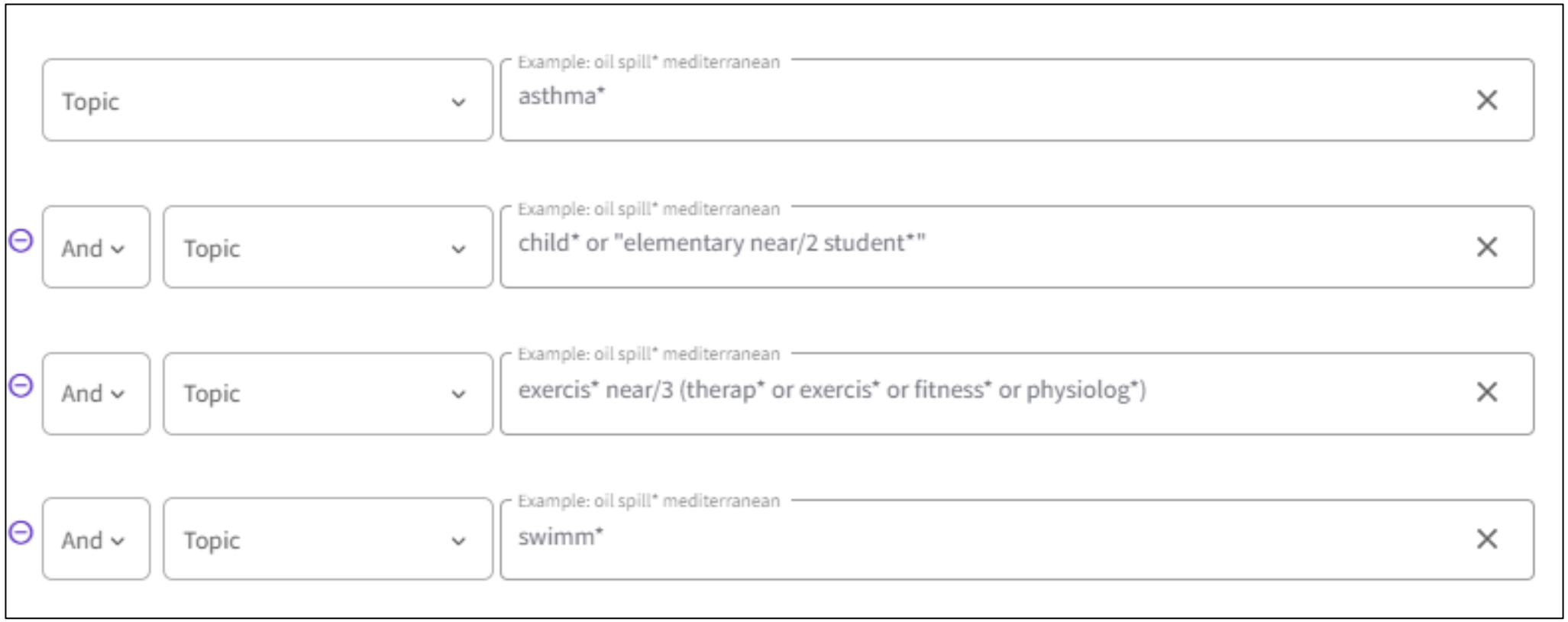
            - **Swimming**
              - Diving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asthma*
And
Topic
Example: oil spill* mediterranean
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swimm*

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Lee, BA

Apr 2024 | JOURNAL OF WATER AND HEALTH 22 (4) , pp.735-745

Swimming is a widely practiced exercise in modern society, where there is a heightened interest in health. The exceptional benefits of swimming are well-known, yet the issue of water quality management inevitably arises due to its nature as an aquatic exercise. Several studies reported that chlorine disinfectants commonly used in swimming pool water … Show more

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MORRIS, P.J. Physical activity recommendations for children and adolescents with chronic disease. Curr. Sports Med. Rep., Vol. 7, No. 6, pp. 353-358, 2008. Youth with low physical activity and fitness levels and high body fat levels are more likely to develop additional risk factors for cardiovascular disease, such as elevated blood pressure and serum choleste ... Show more

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2 **Evidence-based risk assessment and recommendations for physical activity clearance: respiratory disease**

Eves, ND and Davidson, WJ

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The 2 most common respiratory diseases are chronic obstructive pulmonary disease (COPD) and asthma. Growing evidence supports the benefits of exercise for all patients with these diseases. Due to the etiology of COPD and the pathophysiology of asthma, there may be some additional risks of exercise for these patients, and hence accurate risk ass ... Show more

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Worsnop, CJ

Aug 2003 | CHEST 124 (2) , pp.421-422

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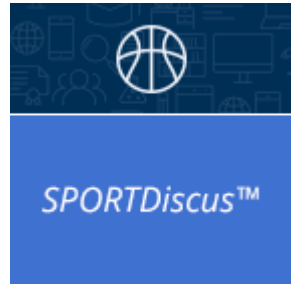

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By: Stricker, P.R. Pediatric Annals. 2000: Vol. 29 Issue 3. p. 166-170-170.

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#11	•••	›	Search: **#6 OR #8 OR #10**	692	11:44:54
#10	•••	›	Search: **#6 AND #9**	164	11:41:31
#9	•••	›	Search: **perform*[Title] OR train*[Title] OR respon*[Title] OR "physical fitness"[Title] OR rehab*[Title] OR physio*[Title]**	1,434,642	11:41:09
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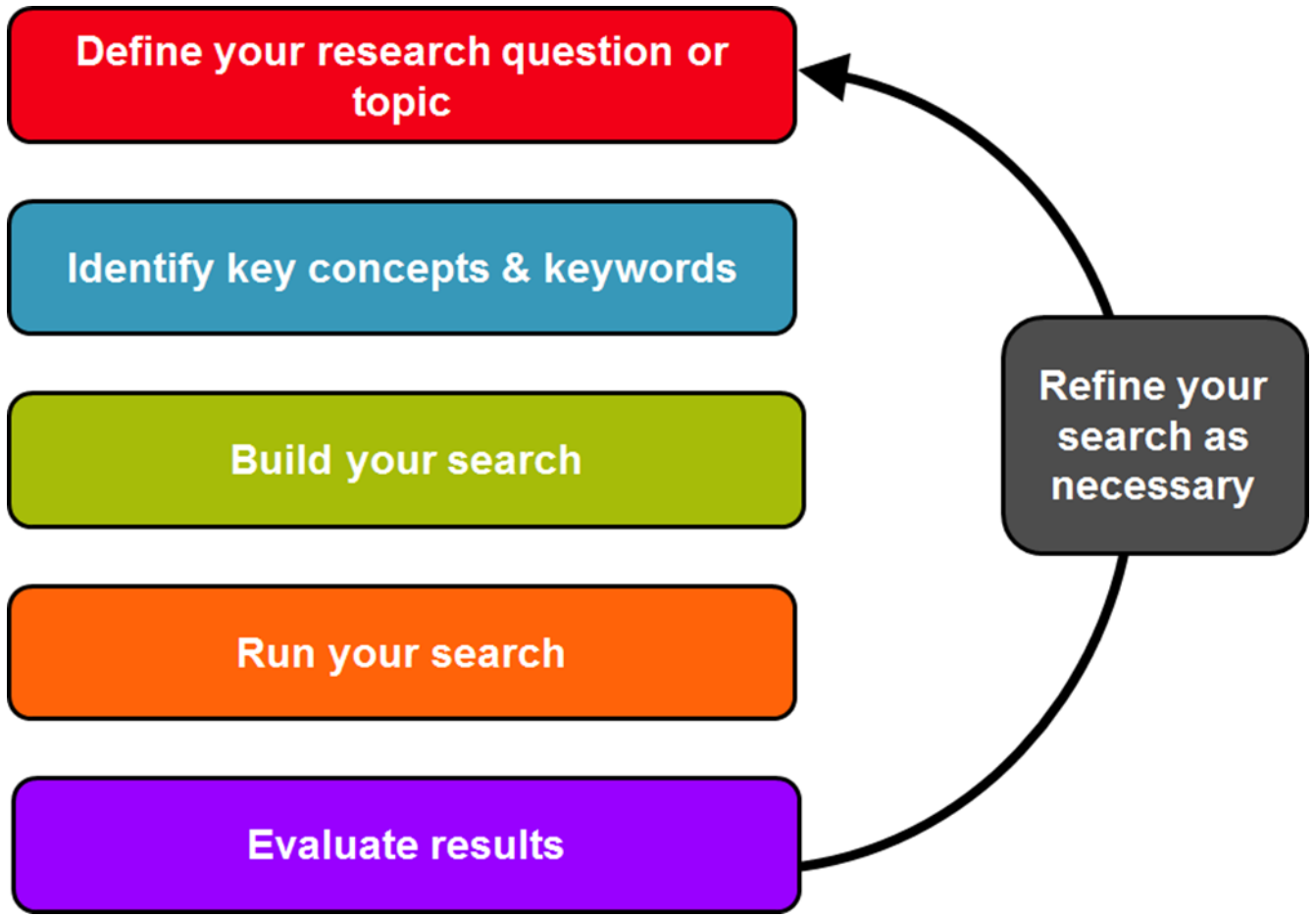
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